CANADA - BRITISH COLUMBIA

FOREST RESOURCE DEVELOPMENT AGREEMENT (F.R.D.A.)

(1985 - 1990)

Backlog Reforestation Program

Extension, Demonstration, Research & Development

(shareable) Sub-Program

Five Year Plan

Province of British Columbia
Ministry of Forests

Canada

May 1986

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1 INTRODUCTION

The $300 million Canada-British Columbia Forest Resource Development Agreement, 1985-1990 (FRDA), is jointly funded and administered by the governments of Canada and British Columbia. The focus of FRDA will be on renewal of Backlog NSR and increased intensive silviculture. This is to achieve the overall objective of securing and expanding the supply of wood, which will allow for the retention and eventual increase of jobs in the British Columbia forest sector (Province of British Columbia and Government of Canada 1985). In conjunction with these backlog renewal and intensive silviculture activities there is a need to refine and improve the forestry practices and techniques used in the program. Consequently, provision was made for a cost-shared Forestry Extension, Demonstration, and Research and Development (E, D, R & D) Sub-Program, and the unilateral funding of initiatives by Canada and the Province that reflect areas of expertise and responsibility. The following plan establishes principles, objectives, and procedures to guide implementation of the cost-shared E, D, R & D sub-program (Backlog Reforestation Program), as jointly conceived by Canada (Canadian Forestry Service, Pacific Forestry Centre) and the Province (B.C. Ministry of Forests, Research Branch).

2 GUIDING PRINCIPLES

Fundamental principles which were observed in the preparation of the cost-shared E, D, R & D sub-program plan, and which will guide its implementation, are as follows:

Management: will be accomplished through joint representation by Canada and the Province on the E, D, R & D Working Group, which is responsible to the FRDA Management Committee.

Implementation and administration: will be accomplished by the Province through policies and procedures governing the operation of the B.C. Ministry of Forests' Research Program.

Focus: will be to address important knowledge gaps faced by field foresters responsible for implementing backlog reforestation operations under FRDA; and to ensure that prompt demonstration and transfer of resulting information is accomplished so that field operations will be improved within the 1985-1990 period.

Scope: will include all phases of backlog reforestation:

- seed collection
- pre- and post-planting surveys and assessments
- tree species selection
- strategies to accommodate other resource values
- site rehabilitation (preparation)
- planting stock selection and nursery production
- planting method, quality, and timing
- plantation protection and maintenance to the free-growing state.

Problem definition: identification of the associated E, D, R & D sub-program priorities and project terms of reference is best accomplished through close cooperation and interaction between field foresters and researchers. Thus, the planning and implementation of the shareable E, D, R & D sub-program will be decentralized (but with uniform standards and operating procedures) and run by Regional Technical Advisory Committees whose memberships will be drawn from the Canadian Forestry Service, B.C. Ministry of Forests (including local research and operations staff), universities and private industry. Ongoing liaison will be maintained between Technical Advisory Committees to avoid project duplication.

3 BACKLOG REFORESTATION CHALLENGES

The overall timber supply in British Columbia could fall to as little as two-thirds of the present harvest level when the merchantable old-growth stock is exhausted, unless silviculture activities are intensified and expanded (Province of British Columbia 1980). The B.C. Ministry of Forests has identified over 1 million hectares of Backlog NSR in the province, 59% of them classified good and medium growing sites. Rehabilitation of these unstocked lands represents an enormous undertaking, with costs in the hundreds of millions of dollars. The potential benefits, however, in terms of reducing the impact of wood supply falldown and maintaining a strong forestry sector in the province, have been clearly documented (Environment Canada 1984).

FRDA (1985-1990) will make a start by providing $140 million in cost-shared funds for the rehabilitation and planting of 150,000 hectares. The NSR land involved includes some of the best growing sites in the province, but are expensive to treat since the majority are encroached upon or overtaken by undesirable woody plants and non-commercial tree species. The investment per hectare (over $1,000, on average) is such that very careful consideration is needed at the outset to define reliable and cost-effective backlog reforestation systems -- comprised of a combination of site rehabilitation, planting, and stand maintenance treatments -- which match site conditions. However, since most operational practice and supporting research has to date focussed on current reforestation, knowledge of backlog sites and experience with proven silvicultural treatments is not as extensive. A major challenge will be to implement the backlog reforestation program in a cost-effective manner and with recognition to other resource values, and to introduce improved procedures arising from the supporting research and development activities as expeditiously as possible.

4 E, D, R & D PRIORITY TOPICS

The following topics represent an up-to-date assessment of the key E, D, R & D initiatives needed to support FRDA backlog reforestation operations in British Columbia between 1985 and 1990:

Extension and demonstration of existing research information

Widespread delays and failures to adapt and use existing information indicate that innovative techniques are needed to transfer technology to field foresters. Improving this deficiency is an important part of the new research and development initiatives being proposed in the priority areas described below. Clearly, the integration of research, development, technology transfer, and application is necessary to solve the complex problems of backlog reforestation in the province. To ensure that early backlog reforestation activities under FRDA are implemented with the best available current information while new research and development is in progress, the following initiatives will be pursued on a province-wide basis:

- cooperation with field foresters in: defining the condition (biological and operability) of Backlog NSR and its classification for treatment purposes; developing, demonstrating, and reporting (with handbooks, audio-visual aids, etc.) "interim" prescriptions for reforesting these lands based on detailed identification, classification, and documentation of treatments that have or have not worked (including an analysis of reasons for successes and failures); monitoring the biological effectiveness of backlog reforestation prescriptions, as a basis for correcting deficient prescriptions and taking directed action in research and development;

- encouragement of, and active participation in, the efforts of forestry education institutions (e.g., universities, technical institutes, Silviculture Institute of B.C. etc.) and silviculture committees (NSC, SISCO, CSC) to improve the technical knowledge and skills of present and future field silviculturists.

Forest vegetation management research

Good and Medium site NSR in British Columbia is, to a large extent, occupied by hardwood, shrub, and herbaceous vegetation. This vegetation hinders planting operations and entails costly site preparation. Regrowth and subsequent competition with planted seedlings is also a major concern, often irrespective of the quality of plantation establishment. Non-crop vegetation needs to be managed so that site resources can be redirected to the crop trees to assure their rapid dominance, while impacts on other resources (such as fish, wildlife, and recreation) are minimized. The present understanding of the biology of vegetative competition and the consequences and potential of various vegetation management treatments and tools is limited. Some progress has been made in recent years, but efforts must be accelerated because of the acute nature of the problem on Backlog NSR. Research and development initiatives to be pursued are as follows:

- screening trials and side-by-side comparisons to evaluate the effect of promising vegetation management techniques (including chemical, manual, mechanical, and prescribed fire) both on the control of non-crop vegetation and the establishment and growth of crop trees;
- studies to evaluate the environmental fate of herbicides and to compare environmental effects of chemicals and alternative treatments;

- identification of major environmental factors limiting growth of crop trees, and of the influence of non-crop vegetation on these factors;
- understanding the autecology of major competing species and the synecology of vegetation communities, and applying this knowledge in the design of vegetation management prescriptions;
- developing operationally feasible methods for assessing and predicting levels of competing vegetation.

Planting stock improvement

Good quality seed is a prerequisite to high quality nursery stock. It is also well recognized that seedling morphology and physiology have an important bearing on success or failure of plantation establishment. These factors have been investigated to a considerable extent already, but the very nature of backlog sites and cost of reforestation will demand exacting standards for the quality of planting stock. For all conifers, more research is needed to optimize nursery cultural practices and to develop efficient techniques for stock quality monitoring. Planting stock specifications for problem sites require definition. Effects of the interactions of total nursery environment and seed source on subsequent field performance also need investigation. This can be achieved through a combination of directed research, closely associated with biological monitoring of production plantation performance. Specific initiatives to be pursued will include:

- stock quality testing, i.e., evaluation of new tests for assessing stock hardiness (cold hardiness, drought resistance) and vigour (chlorophyll induction);
- nursery culture improvements, i.e., optimal seedling espacement, drought adaptation, optimum nutrition regimes, new methods for dormancy induction, improvements to seed quality and germination capacity.

Development of backlog reforestation systems

Backlog reforestation prescriptions must specify the site rehabilitation method, planting stock requirements, and appropriate brushing and weeding treatment. Planting stock has to be defined in terms of species, seed source,[1] production and handling of nursery stock, and planting time and method. Plantation establishment depends not only on selection of treatments, but also on their "level" (i.e., site preparation intensity) and integration into a complete reforestation system for specific types of sites and stand conditions. The selection of the appropriate reforestation system becomes more critical as the severity of the environment increases. A major objective of the R & D program will be to construct such systems for key biogeoclimatic sub-zones in British Columbia by using large-scale, factorial comparisons of individual practices developed from previous or concurrent studies. Fundamental to these studies will be the need to monitor biological processes so that with a better understanding of cause-effect relationships, predictions can be made with greater reliability for other sites. Risk of plantation damage by forest pests, effect of backlog reforestation treatments on other resource values, and the need to quantify the costs and benefits of treatment options will also be considered in these, or closely associated experiments. As demonstration tools, "benchmark" trials of backlog reforestation systems are expected to be valuable.

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[1] Existing seed transfer rules of the B.C. Ministry of Forests are considered acceptable.

5 FIVE-YEAR BUDGET

The $14 million budget for the shareable Backlog Reforestation E, D, R & D sub-program, 1985-1990, provides for a $1.100 million expenditure in fiscal year 1985/86, $2.053 million in 1986/87, and $3.616 million for the remaining years. This budget is apportioned in Table 1 to each of three geographic regions[1], plus there is an amount for sub-program management and administration (termed "activities" for FRDA administration purposes). Allocations to the Northern Interior, Southern Interior, and Coastal backlog reforestation E, D, R & D activities were subjectively determined based on: size of the operational program, extent of current knowledge, site productivity and diversity, and "start-up" time. Provision is made under the "Coastal" activity (No. 2) for E, D, R & D initiatives having provincial scope. These allocations may require adjustment depending on emergence of new information needs and priorities over the term of the sub-program.

TABLE 1. Budget for (shareable) backlog reforestation E, D, R & D sub-program apportioned by fiscal year and activity

Activity No.	Activity Name	Annual Budget by Fiscal Year and Activity ($'000)					
		1985/86	1986/87	1987/88	1988/89	1989/90	TOTAL
1	Northern Interior Backlog Reforestation	435	623	1120	1120	1120	4418
2	Coastal Backlog Reforestation*	448	597	1120	1120	1120	4405
3	Southern Interior Backlog Reforestation	167	600	1120	1120	1120	4127
4	Administration and Management	50	233	255	256	256	1050
TOTAL		1100	2053	3615	3616	3616	14000

*Includes budget for E, D, R & D initiatives having province-wide scope.

[1]Coast = Vancouver Forest Region, coastal portion of the Prince Rupert Forest Region; Northern Interior = Prince George Forest Region, interior portion of the Prince Rupert Forest Region and Quesnel TSA of the Cariboo Forest Region; Southern Interior = Kamloops and Nelson Forest Region and remainder of the Cariboo Forest Region.

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6 IMPLEMENTATION STRATEGY

A Working Group, appointed by the FRDA Management Committee is responsible for the (shareable) E, D, R & D sub-program of FRDA. Planning and implementation of projects to address priority topics (described in Section 5), as they specifically apply to the needs of the Northern Interior, Coast, and Southern Interior regions, will be conducted by three Technical Advisory Committees (one for each region).

Technical Advisory Committees will each be composed of a chairman, Program Management Assistant (contract), and members representing the range of expertise necessary to plan and implement the E, D, R & D sub-program. Participants will be drawn from the Canadian Forestry Service (Pacific Forestry Centre), Ministry of Forests (research and operations), University of British Columbia (Faculty of Forestry), and private industry. Recommended regional five-year E, D, R & D plans will be prepared and updated on an annual basis by each Technical Advisory Committee. Project statements contained in the plan will describe for all studies: objectives, proposed approach, end product, duration, approximate costs, and extension and demonstration provisions.

The Working Group is responsible for assessing recommendations and submitting final proposals, comprised of sub-program authorization forms and project statements, to the FRDA Management Committee for approval. Implementation of approved E, D, R & D projects will be carried out by the Technical Advisory Committees according to the normal Ministry of Forests Research Branch standards and procedures. Projects are expected to include in-house initiatives by the Canadian Forestry Service (Pacific Forestry Centre) and Ministry of Forests Research Program (incremental to base-programs) as well as solicited and unsolicited studies carried out by universities and the private sector.

The principle of a close working relationship between researchers responsible for conducting E, D, R & D projects and field foresters responsible for backlog reforestation will be maintained throughout the planning and implementation phases of the sub-program (i.e. through seminars, workshops, Technical Advisory Committee meetings, etc.). This will ensure that E, D, R & D initiatives are well focussed and directed at key problems, and that any resulting improvements to practices and procedures for backlog reforestation are expeditiously used.

The Working Group and Technical Advisory Committees will monitor all other E, D, R & D projects related to backlog reforestation in British Columbia that are not funded through FRDA, to minimize the risk of duplication and overlap.

7 ANTICIPATED BENEFITS

Substantial knowledge gaps have been identified by the field foresters responsible for implementing the FRDA Backlog Reforestation Program. The mission for the supporting E, D, R & D sub-program will be to help reduce the risks and uncertainties of operational practice by: first, ensuring that available R & D findings are fully used to refine practices and procedures; and second, to address gaps in technical knowledge by implementing new R & D projects. By 1990, a major body of additional knowledge will be available, covering all facets of the backlog reforestation process. This information will also benefit other (current) reforestation activities in the province. Active extension and demonstration initiatives aimed at the field foresters will proceed over the term of the Agreement to ensure they take advantage of existing and new R & D findings. Finally, the resources available under the sub-program will considerably enhance the extent of E, D, R & D capabilities available in the province for addressing silviculture problems and opportunities. The availability of this highly skilled technical resource is crucial in supporting the rapid development of intensified forest management practices in British Columbia.

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